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AUTHOR	Ysseldyke, James E.; And Others
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ABSTRACT

Current screening and diagnostic practices for identifying young handicapped children in Minnesota were surveyed. Information was gathered on the populations served, the professionals and tools employed in screening and diagnosis, decision criteria, and the perception of gaps and duplications in services. The results indicated a heavy reliance on a limited number of instruments for screening, even though the technical adequacy of several of the instruments is questionable. The special educator, in most cases, was the professional most often involved in conducting assessment in the developmental areas. Findings suggested the need to examine how the types of personnel involved in screening influence results and the extent to which duplication actually exists or is only perceived to exist. The need for a policy solution to the problem of promoting cooperation and coordination among agencies is stressed. (Author/CL)

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RESEARCH REPORT #2

CURRENT SCREENING AND DIAGNOSTIC PRACTICES FOR IDENTIFYING YOUNG HANDICAPPED CHILDREN

James E. Ysseldyke, Martha L. Thurlow,
Patrick O'Sullivan and Robert A. Bursaw

EARLY CHILDHOOD ASSESSMENT PROJECT

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Abstract

Current screening and diagnostic practices for identifying young handicapped children in a midwestern state were surveyed. Information was gathered on the populations served, the professionals and tools employed in screening and diagnosis, decision criteria, and the perception of gaps and duplications in services. The results indicated a heavy reliance on a limited number of instruments for screening, even though the technical adequacy of several of the instruments is questionable. The special educator, in most cases, is the professional most often involved in conducting assessment in the developmental areas. It is critical to examine how the types of personnel involved in screening influence results. Several other findings and issues related to early childhood screening and diagnosis are discussed.

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Current Screening and Diagnostic Practices for Identifying Young Handicapped Children

James E. Ysseldyke, Martha L. Thurlow,
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With questions being raised as to whether handicapped children are receiving the maximum benefit from today's schools, early detection of children with handicapping conditions is coming more and more to the forefront of the education field. In 1977, two years after the implementation of PL 94-142, Minnesota became the first state to offer a free, comprehensive screening program to all children under kindergarten age (Lombard, 1980). As of 1981, 24 states had some kind of comprehensive early childhood screening program in operation (Minnesota Department of Education, 1982). The rationale behind this emphasis on screening is the belief that the chances of remediation can be increased significantly through early identification and placement in special education programs (Abbott & Crane, 1977). Therefore, it is believed that these children will subsequently have the best opportunity to develop to their potential (Meisels, 1978).

There has, however, been criticism of the effectiveness of these screening programs. For example, in an editorial, Bergman (1977) described mass screening as a "menace," and also warned against the possibility of a large number of false positives and negative labeling effects. In addition, Keogh and Kopp (1978) cautioned against placement and classification becoming the overriding concerns when making decisions, rather than examining each child's individual circumstances.

Obviously there are factors that complicate early childhood assessment, such as age, severity of handicaps, resources, and personnel, among others. However, the premise behind screening programs, as well as their prevalence and expansion, make them important for educators to study and evaluate. This paper describes the results of a survey designed to determine the current state of practice in early childhood assessment programs in a state that was an early entrant into screening of young children for handicaps.

Method

Subjects

Potential subjects included all agencies that might be involved in screening or diagnostic assessment of children from birth to six years of age. These agencies were identified by the Minnesota Departments of Education (Early Childhood Special Education Coordinators and Preschool Screening Programs), Health (Public Health Nursing Services, Hospitals, Neonatal Clinics), and Human Services (Developmental Achievement Centers, Head Start programs, County Human Services Departments).

Return rates for the agencies varied from 50.0% to 80.6%. Several returns from Developmental Achievement Centers and County Human Services Departments indicated that it was not appropriate for them to complete the survey. The overall return rate was 73.4% (n = 571). The rate of completed surveys was 65.7% (n = 511).

Materials

A three-page survey form was developed to obtain information on ages of children screened, agency services, agencies and professionals to which children were referred, opinions about gaps or duplications in services for preschool children, and the tools/procedures, staff members, and criteria used for screening and for diagnostic assessment. The survey form, which was developed with input from key individuals in the state departments, and the cover letter are included in Appendix A.

Procedure

The survey form was mailed to potential respondents in November, 1984. A follow-up reminder postcard was sent to those who had not responded by December 15, 1984. Preliminary data from a sample of 100 preschool screening and early childhood special education programs were analyzed and presented to groups of early childhood special education specialists and preschool screening coordinators in January and February, 1985, respectively, as a check on the perceived validity of the results. Questions raised at these presentations were used to identify additional analyses to be conducted.

Results

Population Served

Table 1 is a summary of the age data for the children served by the survey respondents. The mean age of the children was 4.39 years (SD = 5.64). The youngest children screened had a mean age of 2.38

Table 1

Summary of Age Data From ECAP Survey

	Youngest Screened	Oldest Screened	Typical Age
Mean	2.38	6.78	4.39
Standard Deviation	1.38	5.03	5.64

Table 2

Percent of Respondents Screening Children of Different Ages

	<1 yr	1 yr	2 yrs	3 yrs	4 yrs	>5 yrs	N of Cases
PSS Clinic	3	3	5	54	92	17	361
Neonatal ICU	100	100	100	67	33	0	3
Head Start	0	0	0	71	96	8	24
DAC	69	66	74	63	37	3	35
Medical Center	33	50	67	100	100	83	6
PHN Service	53	55	62	70	79	45	53
County Human Services	52	52	52	56	56	40	25
Total	16	16	19	58	85	21	507

years (SD = 1.38). The mean age of the oldest children screened was 6.78 years (SD = 5.03).

Table 2 presents the percentages of survey respondents who reported screening children at various ages. Four years was the age at which most (92%) public school systems screened children; 54% screened children at age three. As would be expected, the neonatal intensive care unit (ICU) respondents concentrated on screening children three years of age and younger, while Head Start respondents screened mostly three and four year olds. The Head Start respondents also did not report screening any children under three years of age. All the medical center respondents screened three and four year olds, and a majority of them also screened two year olds, as well as children over five years of age. For public health nursing service respondents, and county human service respondents, approximately equal percentages (most 50-70%) screened children in each age category.

Services Offered

In Table 3, the percentages of survey respondents who offered screening services, contracted for them, or did both are summarized by area. As the table shows, the majority of respondents offered screening services in each area. The area with the lowest percentage of offered services and the highest percentage of contracted services was physical health. In addition, physical health had the highest percentage of respondents who did not offer the service. All seven areas were relatively low in the percentage of respondents both offering and contracting for services: all percentages were below 1.5%.

Table 3

Percentage of Respondents Offering Screening Services, Contracting for Them, or Both by Area

Area	Offered	Contracted	Both	Not Offered
Physical	58.7	11.8	.8	28.7
Hearing	82.1	8.9	.6	8.3
Vision	81.9	9.3	.8	8.1
Speech	86.0	5.3	1.2	7.5
Motor	85.4	5.9	1.4	7.3
Social/Emotional	80.3	5.9	1.2	12.6
Cognitive	84.1	4.9	1.0	10.0

Table 4

Percentage of Respondents Offering Diagnostic Services, Contracting for Them, or Both by Area

Area	Offered	Contracted	Both	Not Offered
Physical	10.0	7.5	---	82.5
Hearing	24.0	9.1	.2	66.7
Vision	19.7	8.1	.2	72.0
Speech	56.7	6.9	.6	35.8
Motor	47.6	10.6	.6	41.1
Social/Emotional	43.7	9.4	.2	46.7
Cognitive	49.4	8.3	.4	41.9

Table 4 is a summary of the percentages of survey respondents offering diagnostic services, contracting for them, or both, by area. As with screening services, very few respondents both offered and contracted for diagnostic services. Speech and language development was the only area in which a majority of respondents (56.7%) offered the service. As was the case with screening, physical health (10.0%) was the area in which services were offered least often. This was followed by vision (19.7%), and hearing (24.0%). Consequently, these three areas had the highest percentages of respondents not offering diagnostic services in any way. The other four areas of speech and language, motor, social/emotional, and cognitive development were all relatively similar in that the majority of respondents either offered diagnostic services, or contracted for them.

Table 5 is a summary of the percentages of respondents offering treatment services, contracting for them, or both, by area. The results for treatment are similar to those for diagnosis in that the majority of respondents did not offer treatment services of any kind for physical health (85.4%), hearing (77.2%), or vision (79.1%). The percentages for speech and language, motor, social/emotional, and cognitive treatment are virtually identical to those for diagnostic services. The only difference is that slightly fewer respondents overall offered or contracted for treatment services than offered or contracted for diagnostic services.

The percentages of respondents offering screening, diagnostic, and treatment services, by area, are shown in Table 6. The data show

Table 5

Percentage of Respondents Offering Treatment Services, Contracting for Them, or Both by Area

Area	Offered	Contracted	Both	Not Offered
Physical	8.5	5.9	.2	85.4
Hearing	15.0	7.3	.6	77.2
Vision	13.2	7.3	.4	79.1
Speech	53.5	6.9	1.0	38.6
Motor	44.5	10.4	1.2	43.9
Social/Emotional	41.1	8.9	1.4	48.4
Cognitive	47.6	7.5	.6	44.3

Table 6

Percentage of Respondents Offering Screening, Diagnostic, and Treatment Services

Area	Percentage
Physical	5.7
Hearing	12.6
Vision	10.8
Speech	48.4
Motor	39.4
Social/Emotional	35.8
Cognitive	41.7

that all three types of services are offered relatively infrequently for physical health (5.7%), hearing (12.6%), and vision (10.8%). The percentages of respondents offering all three services for the other four areas ranged from 35.8% for social/emotional development, to a high of 48.4% for speech and language development.

Screening Data

Table 7 is a summary of the frequencies with which agencies were mentioned by survey respondents as being ones to which students were referred after positive (abnormal) results in each area. As can be seen in the table, the majority of referrals for further evaluation in the areas of vision and hearing problems were made to medical clinics. On the other hand, the overwhelming majority of referrals for speech, motor, social/emotional, and cognitive difficulties were made to the public school systems. However, each area of difficulty included referrals to each of the different agencies listed. As a result, there were referrals made to the public schools for physical health problems, and referrals made to Public Health Nursing agencies for social/emotional difficulties.

The frequencies of the professionals listed as participating in the screening process in each area are shown in Table 8. MD's were listed most often by the respondents as participating in screening for physical health, hearing, and vision problems. For vision and hearing, nurses were mentioned equally as often as audiologists and optometrists. As would be expected, speech and language screening was done most often by a speech clinician, although approximately one

Table 7

Frequencies of Referral Agencies by Screening Area

Area	Public School	Medical Clinic	Public Health Nursing	Private	Community	Other
Physical Health	9	347	100	69	5	13
Hearing	96	290	70	80	16	67
Vision	59	278	69	121	5	49
Speech	398	28	11	17	73	39
Motor	292	46	23	26	67	40
Social/Emotional	302	33	27	31	132	76
Cognitive	344	22	14	19	114	53

Table 8

Frequencies of Professionals Participating in Screening Areas

Title	Physical Health	Hearing	Vision	Speech Language	Motor	Social Emotional	Cognitive
MD	326*	248*	286*	9	49	16	13
Audiologist	---	118	4	3	---	---	---
Optometrist	---	1	112	1	1	---	---
Speech Clinician	---	8	1	321*	6	4	13
OT	1	---	---	3	116	1	2
Teacher/SpEd	4	27	17	111	205*	216*	285*
Psychologist	---	---	---	4	19	149	98
Nurse	122	115	115	15	20	23	16
PT	2	---	---	---	79	2	2
Social Worker	---	---	---	---	2	34	2
Para-professional	---	---	6	---	2	4	5
Volunteer	4	8	6	---	1	1	1
Other	11	34	20	44	93	98	77
Errors	---	---	---	2	1	4	5

*indicates the most frequently mentioned professional in each area

fifth of the screening professionals listed for this area were either teachers or special educators. The teacher or special educator was listed most often as the screening professional in the motor, social/emotional, and cognitive areas. More people were listed as participating in the screening process in these three areas than for the other four areas.

Table 9 presents the number of screening tools used by the respondents in each area. The mean number of tools reported as being used was highest (2.18) for vision screening, and lowest (1.01) for cognitive screening. The other four areas of speech and language, motor, social/emotional and hearing screening all had means that ranged from 1.32 to 1.64. Speech and language screening employed the largest number of different tools. The lowest number of different tools was reported for hearing, while from 17 to 20 different instruments were used in the other areas.

The assessment instruments used most frequently for screening are shown by area in Table 10. The DIAL (Developmental Indicators for the Assessment of Learning) was by far the instrument most frequently used for speech and language, motor, social/emotional, and cognitive screening. Second to the DIAL in each of these areas was the Denver Developmental Screening Test (DDST). For hearing screening, the vast majority of respondents reported using an audiometer while the majority of them used the HOVT/STYCAR chart for vision screening.

Table 11 presents the percentage of respondents reporting the use of some kind of criteria for making decisions about children's

Table 9

Numbers of Screening Tools Used

	Number of Screening Tools Cited by Each Respondent		Number of Different Tools Cited
	$\bar{X}$	SD	
Speech	1.64	1.64	31
Motor	1.32	.96	19
Soc/Emotional	1.48	.98	20
Cognitive	1.01	1.75	19
Hearing	1.34	1.11	13
Vision	2.18	1.53	17

Table 10

Most Freqently Used Screening Tools[a]

Speech	N	Motor	N
DIAL	226	DIAL	245
DDST	103	DDST	127
Language Sample	71	Beh Obs	32
Own Tool	30	MPSI	28
Beh Obs	30	CIP	22
CIP	25	Portage	10
MPSI	22	Dev Profile	8
DASE	15	Interview	8
Fluharty Preschool	10	Own Tool	8
Speech Interview	10	Gesell	6
		Bayley	5

Social/Emotional	N	Cognitive	N
DIAL	176	DIAL	239
DDST	114	DDST	115
Beh Obs	100	MPSI	34
Interview	38	Beh Obs	27
Parent Report	27	CIP	23
MPSI	24	Dev Profile	10
Health History	15	Portage	10
CIP	12	Own Tool	7
Portage	11	Bayley	7
MCDI	7	Caldwell	6

Hearing	N	Vision	N
Audiometer	345	HOVT/STYCAR	283
VASC	41	Cover Test	99
Tympanometer	28	Corneal Reflect	93
Aud. Eval.	19	Snellen	86
Otoscopic Exam	17	Beh Obs	80
Beh Obs	10	Muscle Balance	40
Interview	10	Ext. Inspection	21
Freefield	6	Interview	8
Whispers	5	DIAL	5

[a]Limited to tools listed by at least five respondents. Full names of tools are listed in Appendix B.

Table 11

Percentage of Respondents Using Some Screening Criterion

Area	Percentage
Speech	91.5
Motor	92.2
Social/Emotional	87.7
Cognitive	90.3
Hearing	91.7
Vision	90.8
Total	90.7

Table 12

Numbers of Professionals for Diagnosis

	Number of Professionals Cited by Each Respondent		Number of Different Professionals Cited	
	$\bar{X}$	SD		
Speech	1.21	.62	Speech	8
Motor	1.57	.76	Motor	11
Soc/Emotional	1.51	.74	Soc/Emotional	11
Cognitive	1.44	.67	Cognitive	11
Hearing	1.36	.83	Hearing	10
Vision	1.26	.52	Vision	9
Physical	1.17	.48	Physical	8

screening results. All six areas had similar percentages, which ranged from 87.7% for social/emotional to 92.2% for motor screening. The mean percentage was 90.7%.

The actual criteria stated by the respondents for each screening area were examined in greater detail to discover any consistencies and/or disparities among respondents. In the areas of speech and language, motor, social/emotional, and cognitive development, the majority of respondents who used the DIAL for screening reported using the DIAL norms, in the form of cutoff scores by age, to make decisions about referrals. A small proportion (approximately one-fifth or less) reported clinical judgment as their criterion. Those respondents who employed instruments other than the DIAL similarly noted most often that they used normative information from the tests to make decisions. Clinical judgment was reported in connection with these other instruments as well. A relatively small proportion of respondents noted rather vague criteria, such as "delays noted," or "abnormal results." Since most respondents reported using the same tools for screening and diagnosis for vision and hearing, the criteria for these areas will be discussed in relation to diagnostic assessment.

Diagnosis Data

Data on the numbers of professionals cited as participating in diagnostic assessment are shown in Table 12. The mean number of professionals listed by a respondent ranged from 1.17 to 1.57 for the seven problem areas. Also shown in Table 12 are the total numbers of different professional titles cited across all respondents, by area.

These numbers show that there were at least eight, and as many as eleven different professionals cited as performing diagnostic services in every area.

Table 13 presents the frequencies of the professionals listed as participating in in-depth diagnosis, by area. As was the case with screening, MDs were cited by the majority of respondents as performing diagnostic services for physical health problems, followed by RNs. For vision, RNs were cited most often with MD's and ophthalmologists also mentioned frequently. As one would expect, diagnosis for speech and language problems was most often performed by speech clinicians, and the majority of hearing diagnosis was done by audiologists. For the areas of motor, social/emotional, and cognitive diagnosis, teachers and special educators were cited most often. Interestingly, they were cited more often than occupational therapists for motor diagnosis and more often than psychologists for social/emotional and cognitive diagnosis. As can be seen in the table, there were some instances where a professional was cited for performing diagnostic services in a seemingly unrelated area. For example, audiologists were cited in the area of vision, and occupational therapists were mentioned in the area of cognitive development.

Table 14 summarizes the number of diagnostic tools employed in each area. Speech and language was the area in which the mean number of tools used was the highest (3.88). The respondents reported using, on the average, from two to three tools each for the motor, social/emotional, and cognitive areas. The mean numbers of diagnostic

Table 13

Frequencies of Professionals Participating in Diagnostic Areas

Title	Physical Health	Hearing	Vision	Speech Language	Motor	Social Emotional	Cognitive
MD	125*	72	96	3	10	8	3
Audiologist	---	105*	4	---	---	---	---
Optometrist	---	1	46	---	---	---	---
Speech Clinician	1	9	---	275*	16	14	22
OT	2	---	1	3	130	5	4
Teacher/SpEd	5	13	14	49	177*	185*	208*
Psychologist	---	1	---	7	28	132	126
RN	90	93	107*	7	9	11	10
PT	2	---	---	---	55	1	1
Social Worker	---	---	---	1	1	18	2
Para-professional	---	4	4	---	8	3	4
Volunteer	1	4	6	---	1	8	3
Other	7	18	11	21	28	41	26
Errors	---	1	---	2	1	1	15

*indicates the most frequently mentioned professional in each area

Table 14

Number of Diagnostic Tools Used

	Number of Diagnostic Tools Cited by Each Respondent		Number of Different Diagnostic Tools Cited
	$\bar{Y}$	SD	
Speech	3.88	2.55	41
Motor	2.40	1.63	42
Social/Emotional	2.17	1.23	39
Cognitive	2.64	1.67	41
Hearing	1.52	.86	20
Vision	1.92	1.22	18
Physical	1.54	1.07	18

tools used for vision, hearing, and physical problems were lowest, with all three averaging fewer than two. The largest numbers of different tools mentioned across all respondents were for diagnosis of speech, motor, social/emotional, and cognitive problems. In each of these four areas, the number of different tools used was approximately 40. For each of the other three areas (vision, hearing, and physical problems), approximately 19 different tools were employed.

Table 15 presents the assessment tools most frequently mentioned as being used for diagnosis in each area. In the areas of vision and hearing, the HOVT/STYCAR chart and an audiometer were listed, respectively, as the tools used most often. For speech and language, the tool mentioned most often was a language sample, followed closely by the Peabody Picture Vocabulary Test (PPVT). Social/emotional difficulties were most often assessed using behavioral observations. Physical problems were assessed most often by a professional examination, followed by health history information. In the area of motor difficulties, the diagnostic tool mentioned most often was the Gesell Developmental Scales, followed by the Brigance Inventory of Early Development. For cognitive diagnostic assessment, the Stanford-Binet was listed most often, followed closely by the McCarthy Scales of Children's Abilities, and the Gesell Development Scales.

Table 16 is a summary of the extent to which the tools used for screening and diagnosis were congruent. The table presents the percentages of respondents for which half or more of the tools listed for diagnosis also were listed for screening. As can be seen in the

Table 15

Most Frequently Used Diagnostic Tools[a]

Speech	N	Motor	N
Language Sample	118	Gesell	62
PPVT	114	Brigance IED	54
AZ Test of Artic	58	Beh Obs	41
TACL	50	Miller Assess	36
Templin-Darley	42	LAP	31
Zimmerman	37	Bruininks-Ost	30
PLS	28	Beery	29
Goldman-Fristoe	24	DIAL	28
DIAL	23	Bayley	20
DSS	9	Battelle	8

Social/Emotional	N	Cognitive	N
Beh Obs	107	Stanford-Binet	64
Interview	55	McCarthy	56
Gesell	29	Gesell	52
DIAL	22	Brigance IED	46
Inform Assess	20	Kaufman	43
Burks Beh Rating	20	LAP	31
Vineland	18	WPPSI	30
LAP	16	Beh Obs	28
Brigance IED	13	DIAL	26
VULPE	8	Battelle	8

Vision	N	Hearing	N
HOVT/STYCAR	73	Audiometer	131
Cover Test	35	Tympanometer	36
Corneal Reflect	30	Audiological Exam	16
Beh Obs	29	Profess Exam	15
Profess Exam	23	VASC	8
Snellen	17	Beh Obs	5
Muscle Balance	12		
Informal Assess	3		

Physical	N
Profess Exam	48
Health History	32
Beh Obs	14
Interview	14
Informal Assess	11

[a]Limited to tools listed by at least five respondents. Full names of tools are listed in Appendix B.

Table 16

Congruence Between Screening/Diagnostic Tools

Area	Percent With Half or More Same Tools
Speech	13.2
Motor	17.0
Social/Emotional	29.0
Cognitive	15.0
Hearing	70.5
Vision	69.2
Total	30.0

Table 17

Percentage of Respondents Using Some Diagnostic Criterion

Area	Percentage
Speech	89.2
Motor	84.7
Social/Emotional	82.9
Cognitive	83.8
Hearing	74.9
Vision	72.5
Physical	72.7
Total	81.1

table, 30% of the respondents used half or more of the same tools overall (physical problems is not included). The speech, motor, social/emotional, and cognitive areas all have percentages lower than 30%. For vision and hearing, the congruence percentages are much higher, at approximately 70%.

Table 17 presents the percentages of survey respondents who reported using some sort of criterion for making decisions about their diagnostic assessments. Across all seven areas, the percentage was 81.1%. Speech and language was the area in which the highest percentage of respondents reported using some criteria. The three lowest percentages were reported for hearing, vision, and physical problems.

A more detailed analysis of the actual criteria reported by the respondents revealed that for speech and language, most respondents expressed their criteria in terms of some kind of normative information. A standard of from one to two standard deviations below the mean of the instrument used was reported most frequently. Criteria referring to developmental delays of from one to two years, or from 10% to 25% were mentioned almost as often. The respondents reported very similar criteria for the areas of motor development and cognitive development, in that the same kinds of information (i.e., delays and standard deviations) were used most frequently. In each of these three areas, a small proportion noted clinical or professional judgment instead of normative information. The area of social/emotional development was one in which clinical judgment was

reported more frequently than either delay criteria or standard deviation criteria. As with screening criteria, some respondents used vague and undefined criteria, such as "significant emotional problems," and "discrepancy between [the] child's potential and achievement," for social/emotional and cognitive development, respectively.

The respondents were fairly uniform in the hearing criteria that they reported. Most used 500Hz at 25dB and 1,000, 2,000, and 4,000Hz at 25dB as their standards for passing or failing. Typically, a child would be rescreened after one to two weeks if the first screening was failed. Then, after failing twice, the child would be referred.

The criteria mentioned for vision was also fairly uniform across respondents. They typically used 10/25, or 20/40 eyesight, along with a two-line acuity difference between eyes, as measured by the eye chart, as the standards for failing. In addition, observable eye problems were referred for further evaluation and/or treatment. The procedures were basically the same as for hearing in that a child usually had to fail two screenings to be referred.

Gaps/Duplications

The frequencies of survey respondents noting perceived gaps and/or duplications in serving the health and educational needs of preschool children are shown in Table 18. Among those responding to this survey item, over half (235 out of 442) reported some gaps or duplications. Public school systems were the only respondents for whom the number reporting no gaps or duplications was greater than the

Table 18

Frequencies of Reported Gaps/Duplications in Service

	Yes	No	Totals
PSS Clinic	152	161	313
NICU	2	1	3
Head Start	13	7	20
DAC	25	4	29
Medical Center	5	1	6
PHNS	26	21	47
County Human Service Directors	12	12	24
Totals	235	207	442

number reporting gaps or duplications. The group with the largest proportion of respondents indicating gaps or duplications was the DAC group. Out of 29 respondents, 25 noted some gaps and/or duplications in service. A variety of responses were given to the gaps and duplications question. They are reported separately by responding group here because of the differences that seemed to occur.

Preschool screening programs. In responding to the open-ended question on gaps and duplications in services, a random sample of 100 school programs identified gaps more frequently than duplications by a margin of 3 to 1. A total of 141 gaps or duplications were noted. Gaps in services for children from birth to age 3 were noted most often (n = 22, 15.6%), followed by lack of coordination with the medical community (n = 14, 9.9%). Other gaps noted by the preschool screening programs were as follows:

- Parent cooperation and training (n = 11, 7.8%)
- Physical health screening (n = 9, 6.4%)
- Inappropriate and delayed referrals (n = 9, 6.4%)
- Inadequate services for "gray area" children (n = 9, 6.4%)
- Inter-agency communication (n = 7, 5.0%)
- Lack of agencies and personnel in rural areas (n = 5, 3.5%)
- Use of inappropriate staff (n = 4, 2.8%)
- Transportation difficulties (n = 3, 2.1%)
- Funding difficulties (n = 3, 2.1%)

Duplications were noted in 35 responses (24.8%). All of these referenced duplications among various professionals and/or agencies.

Most referred to the overlap in services of the Department of Education (PSS), the Department of Health (EPS), and the Department of Human Services (EPSDT), and sometimes with Head Start.

A variety of other issues were noted in the remaining responses to the gaps and duplications question (e.g., lack of service for over-income families, DAC waiting lists, etc.).

Head Start programs. For Head Start repondents, gaps were noted more often than duplications by a margin of almost 4 to 1. However, the total number of responses to the question was just 14. The primary gaps mentioned were the lack of communication and coordination among agencies (n = 3, 21.4%), lack of services for over-income families (n = 2, 14.3%), and lack of health and dental screening (n = 2, 14.3%). Other responses, each noted once (17.1%), were: not enough services for 3-year-old children, poor follow-up, poor referral system, and inadequate local education agency services. Duplications were noted in three responses (21.4%) -- all referred to overlaps in services of PSS, EPS, EPSDT, and Head Start.

Day achievement centers. DACs also noted gaps more often than duplications, with the ratio being approximately 6 to 1. The most frequently mentioned gap was a lack of services, especially for mildly handicapped children (n = 11, 32.4%). Other gaps noted by more than one respondent were as follows:

- Lack of services for children birth to 3 years (n = 5, 14.7%)
- Poor referral system (n = 4, 11.8%)
- Funding difficulties (n = 2, 5.9%)

· Parent cooperation (n = 2, 5.9%)

Gaps noted by one respondent included lack of communication, poor child find, personnel needs, and minority needs.

Duplications noted by the DACs all involved references to overlapping services (n = 5, 14.7%).

Medical facilities. Only nine gaps and duplications were noted by respondents from medical facilities. Poor screening and personnel needs were the only gaps noted by at least two respondents. All other gaps were noted by only one (rural needs, transportation, agency coordination, "gray area" children missed). Only one response referred to duplications -- it referenced service overlaps among agencies for individual children.

Public health nursing services. Services to children from birth to three/four years of age was the most frequently noted gap (n = 9, 28.1%). This was followed by inter-agency communication (n = 5, 15.6%), services for poor (n = 4, 12.5%), inadequate referral systems (n = 3, 9.4%), lack of programs (n = 3, 9.4%), and follow-up (n = 2, 6.2%). Other gaps mentioned by individual respondents (3.1%) were child find, citizen awareness, counseling, and gray-area children services. Only two responses (6.2%) focused on duplications; both noted the overlap of services from EPS, PSS, etc.

County human services. Of the 13 responses from this group, two (15.4%) referred to duplications created by overlap of services from EPS, MDs, PSS, EPSDT, and Head Start. The gap most frequently noted was inadequate services in some rural areas (n=3, 23.1%). Other gaps

noted were services for children 0-3 years, counseling, "gray area" children, services for the poor, and transportation to services.

Discussion

Preschool screening is a relatively new activity. Yet, it is an activity that has critical implications for handicapped children. The importance of early identification and intervention for these children has been documented (cf. Casto & Mastropieri, in press; White, Bush, & Casto, 1984). Yet, relatively little attention has been given to the preschool screening process that is supposed to be the basis for early identification. There is a need to obtain even the most fundamental level of knowledge about preschool screening and subsequent diagnosis of children that occurs prior to the time they reach school age.

Minnesota was one of the first states to devote resources to preschool screening activities, and as such, has had time to get its program and procedures established. It, therefore, is an ideal state in which to begin to collect basic information on the preschool screening process. The purpose of the present study was to obtain descriptive information on who is screened and/or given diagnostic assessment, who does it, and how it is done. The in-the-field interest in this type of research activity was evidenced by the cooperation of the people who were surveyed. Clearly, there is a high degree of interest in studying what is being done, and in finding ways to improve the process if it seems appropriate.

As the survey results indicate, Minnesota has a fairly comprehensive and wide spread screening network, in which the majority

of agencies contacted provide some type of screening services in each of the seven areas. The percentage of agencies offering diagnostic and treatment services progressively decreases, as would be expected given the smaller number of children requiring these. However, few agencies supply all three types of services by themselves. Instead, the population must rely on and cooperate with various other agencies to serve all the children identified through screening statewide. As would be expected, different types of agencies screen different populations of children. It appears, from the age data for screening, that each age group is being covered by at least one type of agency, thereby helping to ensure maximum coverage of all children. Medical agencies more often provide screening, diagnostic and screening services for children younger than 3 years of age. Usually, for this age group, children who are screened are those who have more obvious and severe handicaps (see Ysseldyke, Thurlow, Weiss, Lehr, & Bursaw, 1985). Preschool screening programs more often are involved with children who are 3 to 5 years old, and generally, whose potential handicaps are less severe.

The screening agencies, when referring children for further evaluation, tend to lump together referrals for speech and language, motor, social/emotional, and cognitive difficulties, and to refer them to the public school systems for further diagnosis. The school system, of course, is the most convenient and least costly agency for a referral. There were referral agencies reported that did not seem logical, such as referring physical health problems to the public

schools. Perhaps these referrals, while infrequent, reflect a search for convenience rather than the best quality service by the msot logical agency.

Teachers or special educators appear to be performing most of the initial screening in the areas of motor, social/emotional, and cognitive development. This finding leads to the question of how the decision is made about who are the best qualified individuals to administer various screening instruments. Is the validity or sensitivity of a screening decision the same when children are screened for motor problems, for example, if it is done by teacher as when it is done by an occupational therapist? Convenience may be the reason that teachers are selected to screen children. Is this convenience at the expense of appropriate identification? Also, is time taken away from instruction to administer tests? The influence of the types of personnel involved in screening needs to be examined.

Availability of professionals may be a factor influencing who performs screening. For example, consider the isolated findings that occupational therapists are being used to screen for speech and language problems and that audiologists are screening children for vision. These professionals would not be the most logical choices to perform these duties. It may be that the respondents reporting these instances do not have a complete staff of professionals and therefore must "double up" and cross over on their duties. In any case, these instances again raise the issue of how decisions are made about who will be involved in screening, and the issue of the possible effects of such decisions.

Similar issues are raised when one looks at the professionals involved in more in-depth diagnostic assessments that follow screening. There does seem to be greater role specification for diagnostic assessment, with the more medically-oriented areas of physical health, vision and hearing assessed by medically-oriented professionals. However, there also is a wide range of professionals performing diagnostic assessment in each area, a finding that suggests little specialization or role definition. As in screening, teachers and special educators perform most of the diagnostic assessment for motor, social/emotional, and cognitive difficulties.

The tools used for screening were relatively consistent across respondents. Most striking was the overwhelming preference for first the DIAL, and second the DDST for speech and language, motor, social/emotional, and cognitive screening. This suggests an almost blind faith in these instruments in that virtually everyone uses them almost exclusively for screening in these areas. However, Lichtenstein and Ireton (1984), and Salvia and Ysseldyke (1985), both consider the DIAL as having little empirical support for its validity. They characterize the DIAL as having poor reliability, as well as questionable representativeness in its norms. In fact, Salvia and Ysseldyke point out that the DIAL-R, which is the revised version of the original, has questionable technical adequacy and "is best considered an experimental test" (p. 430). The DDST also has technical difficulties. While its validity and reliability are adequate, the representativeness of the standardization sample, which is limited to the city of Denver, is questionable.

In addition to the DIAL and the DDST, three other tools were used relatively frequently in screening for speech and language, motor, social/emotional, and cognitive problems. They were the Comprehensive Identification Process (CIP), the Developmental Profile II (DPII), and the Minneapolis Preschool Screening Instrument (MPSI). The CIP manual contains no reliability, validity, or norm group data, something Lichtenstein and Ireton (1984) call a "glaring weakness." These authors describe the DPII as a screening tool whose value as such remains to be shown. The MPSI appears to be very similar to the DDST in that it has good reliability and validity but has norms based on a limited geographic area (Minneapolis).

Thus, the majority of screening agencies appear to be using devices for screening without considering some of their technical shortcomings. It appears that for the most frequently used tools, the shortcomings may be significant.

A much greater variety of tools was used for diagnostic assessment than for screening. This seems to reflect the attempt to further differentiate and examine the difficulties identified in screening. Consquently, there is much less uniformity in the specific tools used by different respondents in each area.

The congruence between screening and diagnostic assessment instruments reflects the extent to which new, and more detailed information is available to assist the decision-making process. Overall, 30% of the respondents reported using half or more of the same tools. However, that number is inflated by hearing and vision,

in which approximately 70% used the same tools. In the other four areas, congruence percentages ranged from 13% to 29%. The extent to which a diagnostic assessment that uses the same tools as screening provides different information needs to be studied.

The mean percentage of respondents reporting use of some kind of criterion to make decisions about screening results was almost 91%. Although that figure seems relatively high, it is important that almost 10% did not report using any criteria to make those decisions. Lower percentages of respondents reported using some decision criteria for diagnostic assessment in each area.

In terms of the criteria reported for screening, the majority of screening personnel in the state seem to be relying on one instrument, and its norms, to help make decisions about children. While these criteria apparently are objective and consistent for all children, one must keep in mind the question of the test's technical adequacy, since the decisions made on the basis of test results are only as good as the quality of the test itself.

Although the majority of respondents at least report using fairly objective criteria for both screening and diagnostic assessment, there seems to be a significant proportion who are more subjective in their decision making, and therefore, more likely to be variable. Consequently, it seems likely that the use of subjective clinical judgment to make decisions would account for some of the variation among the various programs in the state. This could help to explain the finding that the percentages of children who are referred for

services, and even the percentages of children receiving services, in different school districts vary widely (see Thurlow, Ysseldyke, & O'Sullivan, 1985). As a result, a child referred for services in one area of the state might not be referred in another.

With over half of the respondents reporting some gaps or duplications in the early childhood assessment process, it appears that the state's early childhood screening programs are perceived, at least by some, as requiring further refinement. The primary duplication noted by respondents from every group was overlapping services. This was mentioned regardless of the responding group. The extent to which duplication actually exists or is only perceived to exist requires further examination. Clearly, efforts to begin to coordinate the activities of agencies involved in preschool screening and early childhood special education services are critical and need to be pursued. Gaps were noted more often than duplications, but the specific gaps that were mentioned covered a much wider range. Across all responding groups, the gaps that emerged most consistently were (a) services for the 0-3 year old population, and (b) coordination and cooperation among professionals and agencies. The issue of services for children 0-3 years currently is under debate. It appears that action in this area is imminent. The need for cooperation and coordination among agencies has not received the attention that it must if appropriate and cost-efficient services are to be provided. This, of course, is not a new issue. It is a policy issue that in the end will require a policy solution.

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Appendix A

Cover Letter and Survey Form

Dear

The enclosed survey represents the collaborative efforts of three state agencies studying handicapped children between birth and five years of age and services available to them. Once we understand better how young handicapped children are being identified and served, we plan to compare and evaluate alternative approaches to screening, so that resources can be provided to promote effective coordinated services at regional and local levels.

We need your response to obtain a representative sample of Minnesota screening programs. A representative sample will enable appropriate selection of some programs for a follow-up comparison of existing and alternative screening practices. We have included an ID (identification) number on your form so that data can be analyzed according to several variables (geographic location, population size, etc.) without your having to provide us with that information. All data will be analyzed and reported in aggregate only; you or your program will not be individually identified.

We urgently request that you complete this survey as soon as possible, and return it in the enclosed envelope. If we do not hear from you in three weeks, we will phone or write to remind you about returning the survey.

Sincerely,

James E. Ysseldyke

James E. Ysseldyke, Ph.D.
Professor of Educational Psychology

JEY:rjw

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UNIVERSITY OF MINNESOTA
TWIN CITIES

College of Education

Early Childhood Assessment Project
Department of Educational Psychology
350 Elliott Hall
75 East River Road
Minneapolis, Minnesota 55455

ID Number _____

1. What is the age range of children screened at your clinic (in years)? Youngest _____ Oldest _____ What ages do you typically screen? (Check boxes that apply)

☐ Under 1 year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years ☐ Over 5 years

2. What kinds of service does your agency offer? For each area on the left, check the appropriate box if your agency offers screening (brief assessment and referral of at-risk children), diagnostic assessment (more in-depth assessment for identifying handicapped children and their needs), or treatment (intervention for medical or developmental problems). Check all boxes that apply. If you contract with another agency for services, please place a "c" within the appropriate box.

Area	Screening	Diagnostic Assessment	Treatment
Physical Health	☐	☐	☐
Hearing	☐	☐	☐
Vision	☐	☐	☐

Area	Screening	Diagnostic Assessment	Treatment
Speech/Language Development	☐	☐	☐
Motor Development	☐	☐	☐
Social-emotional Development	☐	☐	☐
Cognitive Development	☐	☐	☐

3. Where do you refer children with positive (abnormal) screening findings? For each screening area, use the codes below to indicate the agency where referred children are sent for further evaluation. Next, indicate the professional title of the person(s) performing the evaluation (e.g., MD, RN, special educator).

1-Public School
2-Medical Clinic
3-Nursing or Public Health Agency
4-Private Practice/Contractor
5-Community Resource (e.g., DAC, Headstart)
6-Other (please specify)

Screening Area	Agency Code	Professional Title	Screening Area	Agency Code	Professional Title
Physical Health	_____	_____	Speech/Language	_____	_____
Hearing	_____	_____	Motor	_____	_____
Vision	_____	_____	Social-emotional	_____	_____
			Cognitive	_____	_____

4. Do you believe that gaps and duplications in service exist among agencies serving the health and educational needs of preschool children? _____ If so, to what extent do you think such gaps and duplications exist? Give specifics if possible. _____

_____

_____

_____

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(OVER)

5. For screening, what tools/procedures, staff members, and criteria for referral are used at your clinic? For each developmental area, indicate all tools or procedures (e.g., MDST, DIAL, language sample) in the left column. In the middle column indicate the professional title of the staff member(s) who administer the tool or procedure (e.g., Nurse, Special Educator). In the right column indicate all criteria used to decide whether a child is referred for further evaluation. Some criteria may be objective (e.g., below the X percentile), while others may be subjective (e.g., clinical judgment). Use another sheet of paper if you need more space.

Area	Tool/Procedure Used	Professional Title	Criteria for Referral
Speech/Language Development			
Motor Development			
Social-emotional Development			
Cognitive Development			
Hearing			
Vision			

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6. For in-depth diagnostic assessment, what tools/procedures, professionals, and eligibility criteria for service delivery are used by your agency? For each area on the left indicate all tools or procedures in the left column. In the middle column indicate the title of the evaluator(s) performing the diagnostic assessments. In the right column indicate all criteria used to decide whether a child should receive treatment services. Criteria may be objective or subjective.

Area	Tool/Procedure Used	Professional Title	Criteria for Referral
Speech/Language Development			
Motor Development			
Social-emotional Development			
Cognitive Development			
Hearing			
Vision			
Physical Health			

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Appendix B

Full Names of Abbreviated Tools

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Full Names of Abbreviated Tools

Aud. Eval.	--- Audiological Evaluation
AZ Test of Artic	--- Arizona Test of Articulation
Battelle	--- Battelle Developmental Inventory
Bayley	--- Bayley Infant Scales
Beery	--- Developmental Test of Visual-Motor Integration
Beh Obs	--- Behavioral Observation
Brigance IED	--- Brigance Inventory of Early Development
Bruininks-Ost	--- Bruininks-Osteresky Test of Motor Proficiency
Burks Beh Rating	--- Burks Behavior Rating Scale
Caldwell	--- Cooperative Preschool Inventory
CIP	--- Comprehensive Identification Process
Corneal Reflect	--- Corneal Light Reflection Test
DASE	--- Denver Articulation Screening Exam
Dev Profile	--- Developmental Profile (also DPII)
DIAL	--- Developmental Indicators for the Assessment of Learning (also Revised edition)
DDST	--- Denver Developmental Screening Test
DSS	--- Developmental Sentence Scoring
Fluharty Preschool	--- Fluharty Preschool Speech
Freefield	--- Audiometer held 12 inches behind head
Gesell	--- Gesell Developmental Scales
Goldman-Fristoe	--- Goldman-Fristoe Test of Articulation
HOVT/STYCAR	--- Matching Symbol Test (HOVT)/Screening Test for Young Children and Retardates
Kaufman	--- Kaufman Assessment Battery for Children
LAP	--- Learning Accomplishment Profile
McCarthy	--- McCarthy Scales of Children's Abilities
MCDI	--- Minnesota Child Development Inventory
Miller Assess	--- Miller Assessment Preschool
MPSI	--- Minneapolis Preschool Screening Instrument
Muscle Balance	--- Muscle Balance Test
PLS	--- Preschool Language Scale
Portage	--- Portage Guide to Early Education
PPVT	--- Peabody Picture Vocabulary Test
Snellen	--- Snellen E Symbol Chart
Stanford-Binet	--- Stanford-Binet Intelligence Scale
TACL	--- Test of Auditory Comprehension of Language
Templin-Darley	--- Templin-Dorley Test of Articulation
VASC	--- Verbal Auditory Screening for Children
Vineland	--- Vineland Adaptive Behavior Scale
VULPE	--- Vulpe Assessment Battery
WPPSI	--- Wechsler Preschool and Primary Scale of Intelligence
Zimmerman	--- Zimmerman Preschool Language Scale

ECAP PUBLICATIONS

Early Childhood Assessment Project
University of Minnesota

No. 1 Preschool screening in Minnesota: 1982-83 by M. L. Thurlow, J. E. Ysseldyke, & P. O'Sullivan (August, 1985).

No. 2 Current screening and diagnostic practices for identifying young handicapped children by J. E. Ysseldyke, M. L. Thurlow, P. O'Sullivan, & R. A. Bursaw (September, 1985).

No. 3 Instructional decision-making practices of teachers of preschool handicapped children by J. E. Ysseldyke, P. A. Nania, & M. L. Thurlow (September, 1985).

No. 4 Exit criteria in early childhood programs for handicapped children by M. L. Thurlow, C. A. Lehr, & J. E. Ysseldyke (September, 1985).

No. 5 Predicting outcomes in a statewide preschool screening program using demographic factors by J. E. Ysseldyke & P. O'Sullivan (October, 1985).

No. 6 An ecological study of school districts with high and low preschool screening referral rates by. J. E. Ysseldyke, M. L. Thurlow, J. A. Weiss, C. A. Lehr, & R. A. Bursaw (October, 1985).